#12 Supp Appeal Brief 7-18-02 ary

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6.18.02 — Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

SERIAL NUMBER	:	09/375,695
FILING DATE	:	August 17, 1999
INVENTOR	:	Hoyle et al.
FOR	:	CONSTANT-TEMPERATURE-DIFFERENCE FLOW SENSOR, AND INTEGRATED FLOW, TEMPERATURE, AND PRESSURE SENSOR
EXAMINER	:	Jewel V. Thompson
ART UNIT	:	2855

SUPPLEMENTAL BRIEF ON APPEAL

1. REAL PARTY IN INTEREST

The application is assigned to Lockheed Martin Corporation. The assignment is recorded at reel 010183, frame 0871.

2. RELATED APPEALS AND INTERFERENCES

An appeal brief has been filed in relation to application 09/349,576, filed July 8, 1999, which is related to the present application.

3. STATUS OF CLAIMS

Claims 1-12 were originally filed, with claims 1 and 12 being independent. The claims have not been amended. Claims 1-

12 were finally rejected. Upon consideration of the first appeal brief, prosecution was reopened, with new references applied. Appeal is taken from the rejection of claims 1-12.

4. STATUS OF AMENDMENTS

No amendment after final rejection has been filed.

5. SUMMARY OF THE INVENTION

The invention relates to an integrated fluid flow, temperature, and pressure sensor adapted for use in a complex fluid control system having communication network connections. The sensor (illustrated as 800 of FIGURE 9) includes a body defining or including a path for the flow of fluid therethrough.

In FIGURE 9, the body is 910, and the path includes two threaded pipe fittings 916 and 918, and a fluid path 12, all as described at page 23, line 29 to page 24, line 28. In FIGURE 11, the body is 1110. Fluid path 12 is described in relation to FIGURES 1a and 1b at page 9, lines 5-8. The integrated sensor also includes a fluid flow rate sensor, a fluid temperature sensor, and a fluid pressure sensor, for performing the kinds of system evaluations and control described in conjunction with FIGURE 10, at page 26, line 14 to page 27, line 22. As described at page 27, line 23 to page 28, line 21, a useful arrangement of the integrated flow, temperature and pressure sensors according

to an aspect of the invention is to place one such sensor on each side of a remotely controllable fluid control valve, to thereby allow verification of the operation of each valve, and to detect breaks or leaks in the pipes. The convenience of an integrated sensor makes the assembly of such complex fluid flow systems easy, as the requisite concatenations of elements need not be assembled on-site at each location requiring a sensor.

The reliability of the fluid flow sensor portion of the integrated flow, temperature and pressure sensor is enhanced by avoiding the use of propeller-type, and certain other types, of flow sensors, as mentioned at page 2, line 21 to page 3, line 26. Instead, the flow sensor portion of the integrated sensor uses (a) an upstream fluid temperature sensor (26 of FIGURES 1a, 1b, 2, 3, 4, 5, 6, and 8), described at page 9, lines 18-25, and elsewhere, for determining the upstream temperature of the fluid (page 9, lines 19-21), (b) a heater (18 of FIGURES 1a, 1b, 2, 3, 4, 5, 6, and 8), which is described at page 9, lines 10-12, one possible embodiment of which is identified at page 12, lines 8-10 as being an electrical resistance heater, and (c) a controller or control arrangement (20 of FIGURE 1a or 220 of FIGURE 2, or the structures of other FIGURES) for applying sufficient power to the heater to raise the temperature of the heater above the upstream fluid temperature by a fixed or given amount, as described at page 10, lines 15-24, at page 12, lines 3-8, and at page 32, lines 9-17. Since the control arrangement depends upon knowing

the temperature of the heater (18), some sort of heater temperature sensor must be available; this can be an actual separate temperature sensor (24 of FIGURE 1) thermally coupled to the heater (18) as described at page 10, lines 20-22 and page 12, lines 17-19, or it can be of some other type, such as an electrical heater resistance measurement (page 20, lines 23-31; page 33, lines 17-25).

The pressure sensor (810 of FIGURE 8) of the integrated flow, temperature, and pressure sensor is mounted within the body of the integrated flow, temperature and pressure sensor, as stated at page 32, lines 19-24, and as illustrated in FIGURE 9. In one embodiment, the pressure sensor is of the ratiometric type (page 22, lines 7-15 and page 34, lines 26-30. The pressure sensor generates an electrical signal, which may be analog, representing the sensed pressure (page 22, lines 10-18, page 32, lines 19-25).

The temperature measurements associated with the integrated flow, temperature, and pressure sensor are made with the aid of the temperature sensor(s) used in conjunction with the flow sensor, so no separate equipment is necessary to perform the temperature measurements.

The integrated flow, temperature and pressure sensor includes a signal processor (812) coupled to the controller, the temperature sensor, and the pressure sensor, as described at page 32, lines 25-31, for performing the processing to generate

digital signals representative of the flow, the temperature, and the pressure (page 33, lines 1-3). A standardized connector (940 of FIGURE 9) such as an RJ-45 connector (page 24, lines 10-16) is coupled to the body (910) for providing a convenient connection for the network (340), as described at page 24, lines 10-16, and at page 33, lines 5-11. The unitary nature of the sensor assembly makes rapid and error-free assembly of complex fluid flow systems more likely, as mentioned above, and the inclusion of the controller and processor within the body makes it unnecessary to make electrical interconnections among the elements of the sensors at the time of installation. In addition, the provision of a standardized network connection avoids having to make individual connections of the network to the various elements of the sensor, and thereby makes the network connections more likely to be correct as installed.

6. ISSUES

a. Claims 1-4, 6, 7, and 12 are not unpatentable in a 35 U.S.C. §103(a) sense over Alvesteffer et al. in view of Maloney.

b. Claims 5, 8, and 9 are not unpatentable in a 35 U.S.C. §103(a) sense over Alvesteffer et al. in view of Redford et al.

c. Claims 10 and 11 are not unpatentable in a 35 U.S.C. §103(a) sense over Alvesteffer et al. in view of Widner.

7. GROUPING OF CLAIMS

Independent claim 1, dependent claims 2-4, 6, and independent claim 12, stand and fall together. Dependent claims 5 stands or falls independently of other claims, because it recites matter, namely the storage of information relating to the cross-sectional area of the fluid path, not found in the other claims. Dependent claim 7 stands and falls independently of the other claims, because it recites matter, namely the different wall materials near the heater, not found in the other claims. Dependent claim 8 stands and falls independently of the other claims, because it recites matter, namely the integration of the temperature controller and the processor, not found in the other claims. Dependent claims 9 and 10 stand or fall together, independent of the other claims, because they include matter, namely the ratiometric nature of the pressure sensor, which is not found in the other claims. Claim 11 stands or falls independently of the other claims, because it recites matter, namely the integration of a valve, which is not found in the other claims.

8. ARGUMENT

8A. The Alvesteffer et al reference is directed to a method and apparatus for measuring a fluid. It involves a fluid system 10 including a flow sensor 12 and a circuit 14 forming a

flow meter 16 (block diagram of FIGURE 1 and column 2, lines 62-65). The circuit portion 14 is illustrated in schematic diagrams in FIGURES 3, 4, 5, 6, 9, and 10. FIGURES 7 and 8 illustrate details of different embodiments of the flow sensor 12 of FIGURE 6. The system 10 of FIGUREs 1 and 6 clearly includes two portions, one of which is the flow meter 16, with the other portion being represented by a fluid source 19, main flow passage 18, and fluid destination 20. Similarly, flow meter 16 is made up of two portions, one of which is the flow sensor 12, and the other of which is the circuit 14. The only physical body which is illustrated in the application is found in FIGURES 2 and 2A, and that body is the body of flow meter 12. All of the other relevant representations of the system 10 and its parts (including FIGURES 1 and 6) are in the form of block diagrams representing the functional relationships among the elements. One cannot determine the relative physical locations of the various elements from block diagrams, and thus there is no indication or suggestion whatever in the Alvesteffer et al. reference that the circuit 14 is co-located with the body illustrated in FIGURES 2 and 2A.

The Maloney reference relates to a thermal modelling scheme for producing thermal models of engines, based on the generic engine illustrated in the schematic diagram of the engine system of FIGURE 1 (column 3, lines 11-13; column 6, lines 37-

46). It should be noted that the controller 100 of FIGURE 1 is illustrated as a block remote from the remainder of the engine of FIGURE 1. Thus, there is no suggestion as to the actual location of the controller.

Thus, both the Alvesteffer et al. and the Maloney references are devoid of any indication of the relative locations of the control circuits vis-a-vis the associated control elements (the fluid paths).

8B. The §103 rejection of claims 1-4, 6, 7, and 12 is not proper, because there is no proper nexus for Examiner's suggested combination of Alvesteffer et al. with Maloney, and because the Alvesteffer et al. and Maloney references, even if combined notwithstanding the lack of a proper nexus therefor, do not in such combination make the claimed invention.

There is no proper nexus for Examiner's suggested combination of Alvesteffer et al. with Maloney. It is well established that, in order for Examiner to combine references for purposes of §103, there must be some proper nexus or logical connection between the references. The fact that the references are related to the same general art is insufficient to establish a proper nexus. Instead, the suggestion for the combination must be found within the references themselves, or Examiner must,

using logic and science, show that one of average skill in the art to which the invention pertains would have found it obvious to combine the references.

In the present instance, the references do not themselves suggest a combination, and Examiner's method for showing a relationship therebetween is fatally flawed. In general, Examiner in arguing unpatentability sets forth that which he feels is found in Alvesteffer et al. together with that which Examiner believes to be absent, and then states that the missing element is found in Maloney. From this, Examiner then asserts obviousness. More particularly, Examiner states, at pages 3 and 4 of the Office Action of April 1, 2002

> "Alvesteffer teaches the aspects of the claimed invention, an integrated fluid flow, temperature, the sensor (12) comprising:
>
> a body (10) including a path for the flow of fluid;
>
> a temperature determining means (38) located within the body, and coupled to the path, for making a determination of the upstream temperature of a fluid flowing in the path;
>
> heating means (24) located within the body (col 4, lines 24-34), and coupled to the path, for transferring heat from the heating means to the fluid;
>
> control means (54) located within the body, and

coupled to the heating means and to the temperature means, for applying power to the heating means in an amount required to raise the temperature of the heating means above the upstream temperature by a predetermined amount, and for converting the value of the power into a flow signal representing a corresponding flow (col. 7, lines 59-col. 8, lines 32); signal processor means (130)located within the body, and coupled to the control means, to the temperature determine means, (col. 10, lines 23-30);

signal connector means (136) mounted on the body, and connected to at least the signal processing means, for providing a standard connection between the signal processing means and the signal transmission path (fig. 5); the control means comprises a second temperature determine means (40) coupled to the heating means, for determine the temperature of the heating means; the second temperature determining means is an electrical resistor (column 5, lines 30-33) and the second temperature determining means comprises means coupled to the heating means for measuring the electrical resistance of the heating means (Fig. 4); and the control means comprises means for converting the value of the resistance into a corresponding temperature (col. 7, lines 49-65);

the path is associated with a peripheral wall (22) and wherein the heating means is in the form of a peripheral structure surrounding the peripheral wall, and the thermal contact therewith (fig.2); the peripheral wall is made from conventional materials having a thickness commensurate with the pressure and temperature of the fluid, except in a region near that in which the heating means is thermally coupled, in which region said peripheral wall is made from a material having a higher strength than the conventional materials, of a thickness less than the commensurate thickness (column 4, lines 9-24)

except

"a pressure sensing means located within the body generating an electrical signal representative of the pressure of the fluid; the pressure sensing means generating an analog electrical signal;"

so far, Examiner has merely recited matter which he asserts is found in Alvesteffer et al., together with a statement of what, in his opinion, is not found. It should be noted that Examiner's characterizations do not necessarily match the description of Alvesteffer et al., as for example Examiner characterizes as a "body" that element (10) which Alvesteffer et al. describes as a "system" (column 1, lines 62, 63). Thus, there is no support for Examiner's statement that Alvesteffer et al. "teaches a body (10)

including a path for the flow of fluid." There does not appear to be any characterization in Alvesteffer et al. of a body as a whole, although separate portions of the arrangement of FIGURES 2 and 2A are identified. As a consequence, Examiner is incorrect in his characterization of what is found in Alvesteffer et al.

Following the exposition of what Examiner asserts is to be found in Alvesteffer et al., Examiner then goes on to state

> " Maloney teaches a flow path consisting of heater, temperature and pressure sensors which are controlled by a controller and the signals are processed in the CPU."

Without more ado, Examiner then goes on to the conclusion

> "It would have been obvious to one skilled in the art at the time the that the invention was made to have placed the pressure sensor of Maloney in the flow path of Alvesteffer et al. <u>for the purpose of measuring the pressure of the fluid the then along with the temperature sensor and heater, determine the flow of the fluid [sic].</u> It would have been obvious to one skilled in the art at the time the invention was made the pressure sensor of Maloney now in the flow path of Alvesteffer et al. to output an analog signal since the processor receives analog signals from the sensors to determine the fluid flow."

In the underlined portion of the argument, Examiner appears to attempt to justify the suggested combination of Alvesteffer et al. with Maloney because the resulting structure would "measur[e] the pressure of the fluid" in addition to what the Alvesteffer reference already does. In effect, Examiner is stating that the combination is obvious because adding a pressure sensor to Alvesteffer et al. will allow the Alvesteffer et al. arrangement to measure pressure. This is a tautological argument, unworthy of consideration because Alvesteffer et al. make no suggestion to add a pressure sensing function or to go to another reference to find a pressure sensor to add to the Alvesteffer et al. structure.

In the absence of some such indication in either Alvesteffer et al. or in Maloney to go to the other reference, and in the absence of some substantive argument on the part of Examiner showing that a person of average skill in the art would be motivated to combine the references, the Alvesteffer et al. and Maloney references may not be combined for purposes of §103, and the rejections of claims 1-4, 6, 7, and 12 must fail. Consequently, claims 1-4, 6, 7, and 12 are patentable in a 35 U.S.C. §103(a) sense over Examiner's suggested combination of Alvesteffer et al. with Maloney.

Thus, Examiner is incorrect in the characterization of what is found in Alvesteffer et al., and is incorrect in the method used to find a nexus. Claims 1-4, 6, 7, and 12 are

patentable over Examiner's suggested combination of references for either of these reasons taken alone.

8C. There is yet another reason that claims 1-4, 6, 7, and 12 are patentable over Examiner's suggested combination of Alvesteffer et al. with Maloney, and that reason is that, even if Examiner's suggested combination of Alvesteffer et al. with Maloney is made, notwithstanding the lack of a proper nexus for such combination, the combination thus made does not make out the limitations of the claims. In other words, the claims distinguish over Examiner's suggested combination of Alvesteffer et al. with Maloney. More particularly, claim 1 recites inter alia

> "a body including a path for the flow of fluid; . . .
>
> control means located within said body, . . .
>
> signal processing means located within said body . . .; and
>
> signal connection means mounted on said body, ..."

which location of the control means and the signal processing means does not appear to be found in either Alvesteffer et al. or in Maloney, and which therefore cannot be found in the combination thereof. Since claim 1 recites matter not to be found in either of Examiner's suggested references, claim 1 is

patentable thereover.

Put another way, even if Examiner's argument were arguendo to be credited, to the effect that it would be obvious to combine the alvesteffer et al. system with a pressure sensor of Maloney, there is no basis for placing such a pressure sensor of Maloney within a unitary body, which is to say the body containing the temperature determining means, heating means, control means, pressure sensing means, and signal processing means as recited in claim 1. More particularly, since the Alvesteffer et al. arrangement is a system 10 including disparate elements 12, 14, 16, 18, 19, and 20 (FIGURE 1), not one of which is a "body" per se, it requires more than simply a "combination" argument to place the pressure sensor within the unitary body of the structure of claims 1, 2, 3, 4, 6, 7, and 12. It requires two distinct steps; a first step justifying the combination of the pressure sensor with Alvesteffer et al., and a second step explaining or justifying the placement of such a pressure sensor within the "body" of Alvesteffer et al. There is a complete absence of such as second step in Examiner's explanation of the rejection. In point of fact, Alvesteffer et al. show, describe, and hint at no such unitary body, and so such a second step argument cannot plausibly be made by Examiner.

Claims 2, 3, 4, and 6 depend from patentable claim 1,

and should be patentable therewith.

Claim 7 is independently patentable over Examiner's suggested combination of Alvesteffer et al. with Maloney, because neither reference suggests

> "wherein said peripheral wall is made from conventional materials having a thickness commensurate with the pressure and temperature of said fluid, except in a region near that in which said heating means is thermally coupled, in which region said peripheral wall is made from a material having a higher strength than said conventional materials, of a thickness less than said commensurate thickness."

Examiner's reference to column 4, lines 9-24 of Alvesteffer et al. is to matter which does not support rejection of a two-thickness flow path such as that recited in claim 7. Claim 7 is therefore independently patentable over Examiner's suggested combination of Alvesteffer et al. with Maloney, even if such combination is made notwithstanding the lack of a proper nexus therefor.

It does not appear that Examiner has directed any arguments particularly at claim 12, and the rejection thereof is merely lumped in with a general comment. There being no arguments proffered, claim 12 is deemed to be patentable over

Examiner's suggested combination of Alvesteffer et al. with Maloney.

8D. Claims 5, 8, and 9 are rejected under 35 U.S.C. §103(a) as unpatentable over Alvesteffer et al. in view of Redford et al. This basis for rejection is traversed, because, as to claim 5, the rejection is actually a §102 rejection in which the reference does not disclose the claimed matter, and because, as to the §103 basis for rejection of claims 5 and 8, there is no proper nexus for Examiner's suggested combination of Alvesteffer et al. with Redford et al., because the references cannot be combined, and because the Alvesteffer et al. and Redford et al. references, even if combined as suggested by Examiner notwithstanding the lack of a proper nexus therefor, do not in such combination make the invention recited in claim 12.

Examiner states

> "Alvesteffer et al. teaches the aspects of the claimed invention except the control means comprising a memory preprogrammed with a value corresponding to the cross-sectional area of the path, and the flow determination is in the form of one of mass quantity per unit time and volume per unit time; the signal processing means are integrated into a single unit; the pressure sensing means is a

ratiometric pressure sensor"

and in relation to claims 5 and 8 goes on

> "Alvesteffer et al. teaches a controller comprising a memory. However, it is not specifically taught that there is a preprogrammed memory with a value corresponding to the cross-sectional area of the path, but the processor does teach the mass flow. The preprogrammed memory is just that, preprogrammed by someone or something. It would be obvious . . . to have preprogrammed the memory to provide the cross-sectional area of the path in order to determine the mass flow rate in any structural body since a memory is well known to be a part of the processor unit."

It will be noted that the abovequoted argument by Examiner, as to claim 5, does not at all refer to the Redford et al. reference, but relates only to the Alvesteffer et al. reference. As such, and in the absence of some additional proffer by Examiner, the proper basis for rejection should be anticipation under §102. Presumably, the rejection has been stated by Examiner as being based on §103 since Alvesteffer et al. does not show, describe, or hint at the storage in memory of the cross-sectional area of the path, and so is patentable as to a §102 rejection. However, simply deeming the rejection to be a §103 rejection does not change the statutory requirements for

proper rejection, and in this case, claim 5 is patentable over Alvesteffer et al. with or without combination with Redford et al.

Claim 5 recites inter alia

> "An integrated sensor according to claim 1, wherein said control means comprises a memory preprogrammed with a value corresponding to the cross-sectional area of said path, and said flow determination is in the form of one of mass quantity per unit time and volume per unit time."

which is not found in Alvesteffer et al., so claim 5 is additionally patentable in a §103 sense over Examiner's suggested combination of Alvesteffer et al.in combination with Redford et al., even if such combination is made notwithstanding the lack of a proper nexus for such combination. As an aside, since Alvesteffer et al. has at least two different paths for the flow of fluid, Examiner must not only explain why Alvesteffer et al. renders claim 5 unpatentable, but must also explain which of the two paths is to have its cross-sectional area stored, and the rationale for that choice. In the absence of some proper explanation by Examiner, the rejection of claim 5 must fail.

Claim 8 is patentable over Examiner's suggested combination of Alvesteffer et al. with Redford et al., because there is no proper nexus for such combination. More

particularly, Alvesteffer et al. do not suggest going to another reference to find a pressure sensor for use therewith, and Redford et al. do not suggest combining its ratiometric pressure sensor (or any other ratiometric sensor) with a flow sensor. In the absence of such a suggestion within the references, or some logical explanation by Examiner as to why a person of ordinary skill in the art would be motivated by either of these reference to make the suggested combination of Alvesteffer et al. with Redford et al., the suggested combination cannot be made, and the §103 rejection fails. Thus, claim 8 is independently patentable over Examiner's suggested combination of Alvesteffer et al. with Redford et al. In addition, claim 8 is patentable as depending from patentable claim 1.

Claim 9 is rejected as unpatentable over Alvesteffer et al. in view of Redford et al. Examiner states

> "Redford et al. teaches ratiometric control signals. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have placed a ratiometric sensor of Redford et al. in the mass flow sensor of Alvesteffer et al. in order to provide a measurement of the ratio of pressure proportional to the measurement of heat and temperature."

The Redford et al. reference describes a ratiometric

sensor using at least one photodiode in a voltage divider configuration (column 1, lines 49-52). For the same reasons given above, Examiner's suggested combination of Alvesteffer et al. with Redford et al. cannot be made for lack of a proper nexus. More particularly, Alvesteffer et al. do not suggest going to another reference to find a pressure sensor for use therewith, and Redford et al. do not suggest combining its ratiometric pressure sensor with a flow sensor. In the absence of such a suggestion within the references, or some logical explanation by Examiner as to why a person of ordinary skill in the art would be motivated by either of these reference to make the suggested combination of Alvesteffer et al. with Redford et al., the suggested combination cannot be made, and the §103 rejection fails. Thus, claim 9 is independently patentable over Examiner's suggested combination of Alvesteffer et al. with Redford et al.

Examiner apparently relies upon the desire or need to "provide a measurement of the ratio of pressure proportional to the measurement of heat and temperature" to justify the suggested combination of Alvesteffer et al. with Redford et al. for purposes of rejecting claim 9. The stated desire or need as expressed by Examiner is not understandable in its current form. If the measurement of pressure were in fact to be proportional to the measurement of heat andor temperature as stated, no pressure sensor would in fact be needed, as the pressure

information could simply be extracted from the temperature measurement. If Examiner truly means that desire is for "pressure proportional to the measurement of heat and temperature," then it is incumbent on Examiner to explain how the measurement is to be made, since heat and temperature are related by thermal resistance, which is a function of at least the fluid flow and specific heat. It does not appear that Examiner's attempt to justify the suggested combination of Alvesteffer et al. with Redford et al. measures up to the "logic and science" standard. Consequently, the suggested combination of references cannot be made, and claims 5, 8, and 9 are patentable thereover.

8E. Claims 10 and 11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Alvesteffer et al. in view of Widner.

The Widner reference relates to a combination tire-valve and pressure-sensor which makes use of microelectromechanical techniques. Again, Examiner approaches the rejection in an improper manner, reciting in the most general terms that which is supposedly found in Alvesteffer et al., and stating that the supposedly missing elements are found in Widner, followed by a statement of obviousness. Such a basis for rejection is totally flawed as lacking a proper nexus, and cannot be a proper basis for rejection. Claims 10 and 11 are therefore patentable over Alvesteffer et al. in view of Widner.

Further, both claims 10 and 11 depend from patentable parent claim 1, and are therefore patentable therewith.

9. AUTHORITIES RELIED UPON

For the proposition that there must be identity of each and every element of the claimed invention and the reference in order to find anticipation, appellant relies upon one or more of RCA Corp. v Applied Digital Data Systems, Inc. 221 USPQ 385, 388 (Fed. Cir. 1984); Kalman v Kimberly-Clark Corp., 218 USPQ 781, 789 (Fed. Cir. 1983); Orthokinetics, Inc. v Safety Travel Chairs, Inc., 1 U.S.P.Q2nd 1081, 1087 (Fed. Cir. 1986); Hybritech, Inc. v Monoclonal Antibodies, Inc., 231 USPQ 81, 90 (Fed. Cir. 1986); Carella v Starlight Archery & Pro Line Co., 231 USPQ 644, 646 (Fed. Cir. 1986).

For the proposition that the simple finding of all the elements of the invention in the prior art is insufficient to show obviousness applicant relies upon In re Rouffet, 47 USPQ 2nd 1453, 1457 (Fed Cir 1998); andor In re Kotrab, 55 USPQ 2nd 1313, 1316 (Fed Cir 2000).

For the proposition that Examiner may not use hindsight and the applicants own teaching to find a nexus, appellant relies on one or more of ACS Hospital Systems v Montefiori Hospital, 221

USPQ 929, 933 (Fed. Cir. 1984); In re McCarthy, 226 USPQ 99, 100 (Fed. Cir. 1985); Fromson v Advance Offset Plate, Inc., 225 USPQ 26, 31, 32 (Fed. Cir. 1985); In re Geiger, 2 USPQ 2nd 1276 (Fed. Cir. 1987); Ex parte Gould, 6 USPQ 2nd 1680, 1684 (PTO Bd. of App. and Int. 1987), citing In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984); Heidelberger Druckmaschinen AG v Hantscho Commercial Products Inc., 30 USPQ 2nd 1377, 1380 (Fed. Cir. 1994); In re Dembiczak, 50 USPQ 2nd 1614 (Fed Cir 1999); Para-Ordnance Mfg. Inc. v. SGS Importers Int'l Inc., 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995).

For the proposition that the mere fact that two references relate to the same general subject matter is insufficient to make a proper nexus, appellant relies on one or more of ACS Hospital Systems v Montefiori Hospital, 221 USPQ 929, 933 (Fed. Cir. 1984); In Re Levin, 11 USPQ 2nd 1315, 1316 (Fed. Cir. 1989); In Re Clay, 23 USPQ 2nd 1058 (Fed. Cir. 1992); Oscar Meyer v ConAgra, 35 USPQ 2nd 1278, 1281 (Fed. Cir. 1994)

For the proposition that the Examiner must provide some rationale as to how and why references are to be combined for purposes of showing obviousness, appellant relies on one or more of Ex Parte Kranz, 19 USPQ 2nd 1216, 1218 (PTO Bd. of App. and Int. 1991); In Re Frich, 23 USPQ 2nd 1780, 1783 (Fed. Cir. 1992); Ex Parte Akamatsu, 22 USPQ 2nd 1915, 1923 (PTO Bd. of App. and Int. 1992), citing Ashland Oil v Delta Resins & Refractories, Inc., 227 USPQ 657 (Fed. Cir. 1985); Ex Parte Levengood, 28 USPQ

2nd 1300, 1301 (PTO Bd. of App. and Int. 1993); In Re Rijckaert, 28 USPQ 2nd 1955, 1956 (Fed. Cir. 1993);In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988);

For the proposition that the mere fact that the prior art may be modified in a manner suggested by Examiner does not make the modification obvious unless the prior art suggests the desirability of the modification, and not merely its feasibility, appellant relies on one or more of Winner International v Wang, 53 USPQ2d 1580, 1587, (Fed. Cir. 2000); In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84, (Fed. Cir. 1992); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir.1984)

For the proposition that Examiner may not pick and choose from the references only that which supports his position, appellant relies on In re Hedges, 228 USPQ 685, 687 (Fed. Cir. 1986), citing in re Wesslau, 353 F.2nd at 241, 147 USPQ 391 ,393 (CCPA 1965); In re Wright, 9 USPQ 2nd 1649 (Fed. Cir. 1989).

For the proposition that the references, when combined for purposes of §103, must make the claimed invention, appellant relies on In re Mills, 16 USPQ 2nd 1430 (Fed. Cir. 1990)

For the proposition that a dependent claim is non-obvious if it depends from a non-obvious claim, appellants rely on In re Fine, 5 USPQ 2nd 1596, 1600 (Fed. Cir. 1988), citing Hartness Int=l v Simplimatic Eng=g Co., 2 USPQ 2nd 1826, 1831; In re Abele, 214 USPQ 682, 689 (CCPA 1982).

For the proposition that inductive reasoning may

not be used to derive a general rule from the specifics of the references, In re Lueders, [______], (Fed. Cir. 4/97).@

10. Conclusion

Examiner's rejection of claims 1-12 under 35 U.S.C. §102(b) and 35 U.S.C. §103 is without merit, and the rejection of the claims should be reversed.

11. The appeal fee and the brief fee have already been paid.

Respectfully submitted,

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June 17, 2002
IN TRIPLICATE

APPENDIX

1. An integrated fluid flow, temperature and pressure sensor, said sensor comprising:

a body including a path for the flow of fluid:

temperature determining means located within said body, and coupled to said path, for making a determination of the upstream temperature of a fluid flowing in said path:

heating means located within said body, and coupled to said path, for transferring heat from said heating means to said fluid;

control means located within said body, and coupled to said heating means and to said temperature determining means, for applying power to said heating means in an amount required to raise the temperature of said heating means above said upstream temperature by a predetermined amount, and for converting the value of said power into a flow signal representing a corresponding flow;

pressure sensing means located within said body, for sensing fluid pressure in said path at a location adjacent to one of said heating means and said temperature determining means, for generating an electrical signal representative of the pressure of said fluid;

signal processing means located within said body, and coupled to said control means, to said temperature determining means, and to said pressure sensing means, for processing said

flow signal, said temperature signal, and said pressure signal, for generating digital signals representing said flow, said temperature, and said pressure, for transmission over a digital signal transmission path; and

signal connection means mounted on said body, and connected to at least said signal processing means, for providing a standard connection between said signal processing means and said signal transmission path.

2. A sensor according to claim 1, wherein said pressure sensing means located within said body, generates an analog electrical signal representative of the pressure of said fluid.

3. An integrated sensor according to claim 1, wherein said control means comprises a second temperature determining means coupled to said heating means, for determining the temperature of said heating means.

4. An integrated sensor according to claim 3, wherein said second temperature determining means is an electrical resistor, and said second temperature determining means comprises means coupled to said heating means for measuring the electrical resistance of said heating means, and said control means comprises means for converting the value of said resistance into

a corresponding temperature.

5. An integrated sensor according to claim 1, wherein said control means comprises a memory preprogrammed with a value corresponding to the cross-sectional area of said path, and said flow determination is in the form of one of mass quantity per unit time and volume per unit time.

6. An integrated sensor according to claim 1, wherein said path is associated with a peripheral wall, and wherein said heating means is in the form of a peripheral structure surrounding said peripheral wall, and in thermal contact therewith.

7. An integrated sensor according to claim 6, wherein said peripheral wall is made from conventional materials having a thickness commensurate with the pressure and temperature of said fluid, except in a region near that in which said heating means is thermally coupled, in which region said peripheral wall is made from a material having higher strength than said conventional materials, of a thickness less than said commensurate thickness.

8. An integrated sensor according to claim 1, wherein said control means and said signal processing means are

integrated into a single unit.

9. An integrated sensor according to claim 1, wherein said pressure sensing means is a ratiometric pressure sensor.

10. An integrated sensor according to claim 1, wherein said pressure sensor is a microelectromechanical system device.

11. An integrated sensor according to claim 1, further comprising

a controllable valve having a controllable flow channel connected by a further fluid path to said flow path of said integrated sensor, said controllable valve being within said body; and

a control processor at a location remote from said body of said integrated sensor, and coupled thereto by way of said transmission path, for correlating valve state with fluid flow for one of (a) verifying operation of an element of said integrated sensor and (b) verifying the integrity of fluid paths to which said integrated sensor is connected.

12. An integrated fluid flow, temperature and pressure sensor, said sensor comprising:

a body including a path for the flow of fluid in a region:

a temperature sensor located within said body, and coupled to said path, for making a determination of the upstream temperature of a fluid flowing in said path:

a heater located within said body, and thermally coupled to said path, for transferring heat from said heater to said fluid;

a controller located within said body, and coupled to said heater and to said temperature sensor, for applying power to said heater in an amount required to raise the temperature of said heater above said upstream temperature by a predetermined amount, and for converting the value of said power into a flow signal representing a corresponding flow;

a pressure sensor located within said body, for sensing fluid pressure in said path, for generating an electrical signal representative of the pressure of said fluid;

a signal processor located within said body, and coupled to said controller, to said temperature sensor, and to said pressure sensor, for processing (a) said flow signal, (b) said temperature signal, and (c) said signal representative of the pressure, for generating digital signals representing said flow, said temperature, and said pressure, for transmission over a digital signal transmission path; and

a signal connector mounted on said body, and connected to at least said signal processor, for providing a standard connection between said signal processor and said signal

transmission path.

IN TRIPLICATE